AMATEUR SATELLITE REPORT

Number 153
July 13, 1987

Editor: Vern Riportella, WA2LQQ
Contr. Editors:
Pete Killingsworth, KD7WZ
Managing Editor: Bob Myers, W1XT

AMSAT® NA *Newsletter for the Amateur Radio Space Program*

Amateur Satellite Report is endorsed by the American Radio Relay League as the special interest Newsletter serving the Amateur Radio Satellite Community

AMSAT Life Member Named To Head Goddard Space Flight Center

AMSAT Life Member Dr. John Townsend, W3PRB, has been named Director of the NASA Goddard Space Flight Center in Greenbelt, Maryland. He replaces Dr. Noel Hinners who moves to NASA HQ. Dr. Townsend was instrumental in helping find launch opportunities for OSCARs beginning with OSCAR 5 and continuing through AMSAT OSCAR 8, according to Dr. Tom Clark, W3IWI. Tom is a NASA radioastronomer based at Goddard SFC.

The NASA announcement, made public June 17, reads in part:

"HINNERS AND TOWNSEND APPOINTED TO NASA MANAGEMENT POSITIONS"

"Dr. Noel W. Hinners, Director, NASA Goddard Space Flight Center, Greenbelt, MD, has been appointed NASA Associate Deputy Administrator. Dr. John W. Townsend, Jr. has been appointed to replace Dr. Hinners. Appointments are effective June 22.

"Dr. Townsend began his career at the Naval Research Laboratory in 1949 as a research physicist and transferred, with his branch and the Vanguard Project, to NASA in 1958 becoming chief of its space science division.

"Dr. Townsend was named assistant director, space science and satellite applications at Goddard Space Flight Center in 1959 and deputy director in 1965. He was deputy administrator of the Environmental Science Service Administration (ESSA), Department of Commerce in 1968. In 1970, ESSA became part of the National Oceanic and Atmospheric Administration and he was appointed associate administrator.

"Dr. Townsend ended 30 years of federal service in 1977. Since that time he has been employed by Fairchild Industries in a variety of senior executive positions including, most recently, executive vice president for corporate development.

"Dr. Townsend was educated at Williams College where he received a BA in 1947, an MA in 1949 and a ScD (Hon.) in physics in 1961."

AMSAT extends its hearty congratulations to Jack, W3PRB, on this appointment and a warm welcome back to the NASA fold.

Russian Publications Point To Complex Transponder Suite

Even as word is being received in the West that RS-9 will be further delayed, Russian publications are providing additional details on the communications complement aboard. Recent articles have appeared in *Sovetskiy Patriot* of May 17 and the May, 1987 edition of the Russian monthly magazine "Radio". Translation was done by Dex Anderson, W4KM, longtime AMSAT and ARRL translator of the Russian radio press.

According to these current publications, the transponders are part of a package called BRTK-10 which stands for "Equipment for Radio Amateur Satellite Communication". The system has been built by a team under the guidance of Aleksandr Papkov, himself an ardent radio experimenter and Viktor Samkov at the Tsiolkovskiy State Museum of the History of Cosmonautics in Kaluga. Papkov began his Radio Sputnik construction activities by building the telemetry system for RS-1 and RS-2 which were launched in 1978. Papkov's group has since been responsible for several RS's and ISKRAs.

The complex called BRTK-10 was probably due to be launched as RS-10 but has now been renamed and rescheduled as RS-9. According to the articles, it uses 3 bands combined in various ways to yield up to 5 different modes of operation.

The Modes have been designated as follows based on previous Russian information and some guesswork to fill in the blanks.

1. Mode K uses 15 meters up and 10 meters down.
2. Mode T uses 15 meters up and 2 meters down.
3. Mode A uses 2 meters up and 10 meters down.
4. Mode KT uses 15 meters up and both 10 and 2 meters down.
5. Mode KA uses both 15 and 2 meters up and 10 meters down.

The new modes KT and KA are simply combinations of modes K and T while mode KA is a combination of modes K and A. It now seems apparent the question regarding the significance of the designations "K" and "T" is answered. It now seems likely they stand for "Kaluga" and "Tsiolkovskiy", the city and institution where the satellites are built, respectively.

The exact frequencies to be employed is still somewhat confused. Nevertheless, the following frequencies have been presented in the articles. There are two sub-bands in each of the 3 bands. They are:

15 meters: 21.160 - 21.200 and 21.210 - 21.250 MHz
10 meters: 29.360 - 29.400 and 29.410 - 29.450 MHz
2 meters: 145.860 - 145.900 and 145.910 - 145.950 MHz

There are 8 beacon frequencies specified, 4 on each of 2 bands. They are:

10 meters: 29.357, 29.403, 29.407, 29.453 MHz
2 meters: 145.857, 145.903, 145.907, 145.953 MHz

These frequencies should be regarded as preliminary given that recent system changes were said to be in progress. It is not known what the nature of the changes are which may have caused the launch to be delayed. It may be, in fact, that the satellite changes were facilitated by a launcher delay rather than the other way around.

Another Super HAM-COM Show Attracts 5000 In Texas

HAM-COM was held in the Arlington, Texas, Convention Center June 6 and 7. There were approximately 5000 in attendance. The two hour AMSAT Forum on Saturday morning was packed. A joint presentation on "Introduction to Amateur Satellites" was made by Keith Pugh, W5IU, and Al Brinckerhoff, WB5PMR. Frank Perkins, WB5IPM, followed with an excellent presentation on FO-12 Mode JD. Jeff Walich, N5ITU, finished with a fascinating video show and talk on Weather Satellites.

Booth activity was brisk on Saturday with the booth full at all times. The new N4HY QUIKTRAK Version 3 attracted keen interest. This program is the most advanced tracking program for the IBM PC AMSAT has ever offered and provides features previously available only on the professional level.

Keith Berglund, WB5ZDP, put together an excellent video tape of live QSO's through AO-10. Audio quality is excellent and the station video is broken up by shots of computer graphics and antenna scenes. This tape ran in the booth most of the time and attracted a group of viewers whenever it ran. Ray Hoad, WA5QGD, coordinated the video presentations in the booth. Rusty Reeve, KT5U, provided assistance in all phases of booth operation.

All told, AMSAT continued its tradition of execllent presentations and support at the Dallas Ham-Com.

New UO-11 DCE Station Up

John Biro, K1KSY, is apparently the latest Digital Communications Experiment (DCE) station to interface with the UoSAT OSCAR 11 DCE. John joins NK6K, N5BRG, WDØETZ and WA9FMQ in the U.S and VK5AGR among other DCE participants outside the UK. K1KSY's home packet BBS is K1UGM in Wakefield, Massachusetts. K1KSY will be able to forward limited packet traffic to the authorized U.K. DCE stations and other DCE stations with which the U.S. has third party agreements. You can monitor the DCE title frames by observing the DCE data transfer in straight ASCII on UO-11.

Monitoring the DCE or other UO-11 data at 1200 bps requires only a terminal and a surplus type 202 modem. UO-9 data can also be monitored with the same setup.

Mir Cosmonauts Install New Solar Panels

The Mir cosmonauts are nearing completion of the installation of additional solar panels on the Russian space station. The added power is required for the KVANT astrophysical module which is now attached to the complex. There is talk of a new crew launching to Mir in mid-July but no further word about MAREX, Mir Amateur Radio Experiment, plans. Mir Cosmonauts' voices are heard regularly on 143.625 MHz and data on 166.140 MHz. Best times for voice is after 0600 UTC and after 0100 UTC for data.

New Management Team Formed To Steer Field Activities

AMSAT has established a new team of managers to help organize field activities. Members of the team are called Regional Coordinators. Each Regional Coordinator will have responsibility for the activities in several states. Between three and six states have been assigned to each of the Regional Coordinators. Organizationally, the Regional Coordinators report to Field Operations VP Mike Crisler, N4IFD. The 100 plus Area Coordinators and Assistant Area Coordinators in turn report to the Regional Coordinators.

According to Mike Crisler, N4IFD, the Regional Coordinator team will upgrade the management of field activities by facilitating planning, control and coordination at a more local level than before. Conversely, he says, it will provide better visibility into problems of field support and headquarters liaison.

Mike says the First Team of Regional Coordinators is as follows: Andy Deskur, KA1M; Howard Ziserman, WA3GOV; Byron Lindsey, W4BIW; Mac Jordan, W4DAQ; Larry Koziel, K8MU; Gar Anderson, KØGA; Jim McKim, WØCY; Keith Pugh, W5IU; Jack Crabtree, AA0P; Pete Killingsworth, KD7WZ. Additional Regional Coordinators will be appointed soon Mike said. They will be meeting regularly to finalize Area Coordinator and Regional Coordinator responsibilities and job descriptions and to map out strategies aimed at improving effectiveness in coverage of hamfests, conventions and club meetings. Regional nets and bulletin boards are also under discussion.

Short Bursts

- JAMSAT says it believes it has found all the software bugs and the system should soon be ready for general use.
- AMSAT will be expanding its Research and Development activities in Digital Signal Processing (DSP). According to Tom Clark, W3IWI and Bob McGwier, N4HY, AMSAT will join with TAPR, the Tuscon Area Packet Radio group, to produce prototype hardware and software for this very important new technology. Some very dramatic demonstrations of the potential of DSP in the Amateur context are planned by W3IWI and N4HY. Interested parties are invited to communicate that interest to AMSAT. For background, see *ASR* –146, April 6, 1987.
- Cliff Buttschardt, W6HDO, of Morrow Bay, California, has been named to replace Harry Bluestein, N6TE, as primary Net Control Station for the AMSAT 75 Meter Pacfic Coast Net. Harry's increased work responsibilities warranted the change. Cliff has been acting as backup NCS to Harry in recent months.

AMSAT Information Services Worldwide

Updated as of 01 Jun 87

Part 1. Voice Nets

Service Area	Day	Time	Freq	NCS(Primary)	Notes
International					
International	Sunday	1900 UTC	14.282	WDØHHU	
International	Sunday	1800 UTC	21.280	WDØHHU	1
South Pacific	Saturday	2200 UTC	14.282	W6SP	2
South Pacific	Saturday	2230 UTC	21.280	W6SP	13
Southern, Central & Eastern Africa	Sunday	0900 UTC	14.280	ZS6AKV	
"	Sunday	0900 UTC	7.080	ZS6AKV	
"	Sunday	0900 UTC	3.718	ZS6AKV	
"	Sunday	0900 UTC	3.665(AM)	ZS6AKV	
National					
Australia	Sunday	1000 UTC	3.685	VK5AGR	8
England	Sunday	1015 local	3.780	GØAUK	
England	Mon + Wed	1900 local	3.780	GØAUK	
Sweden	Sunday	1000 local	3.740	SK4TX	
Regional					
U.S. East Coast	Tuesday	2000 local	3.840	WA2LQQ	3
U.S. Central	Tuesday	2100 local	3.840	WØCY	3
U.S. West Coast	Tuesday	2000 local	3.840	N6TE	3
Sub-Regional and Local					
England/Brighton Area	Sundays	1915 local	144.280	G6ZRU	
Scotland/Paisley	Daily	0900 local	144.625	GM1SXX	
South Africa/J'Berg	Sunday	0900 UTC	145.650	ZS6AKV	9
South Africa/J'Burg	Thursday	1830 UTC	145.650	ZS6AKV	
South Africa/Cape Town	Thursday	1730 UTC	145.750	ZR1KE	
South Africa/Durban	Thursday	1730 UTC	145.650	ZR5JJ	
South Africa/Pieter-	Thursday	1730 UTC	145.750	ZR5JJ	10
South Africa/Pretoria	Thursday	1830 UTC	145.775		
South Africa/Pretoria	Thursday	1830 UTC	3.718		
South Africa/Pretoria	Thursday	1830 UTC	3.665		
South Africa/Port Eliz.	Thursday	1830 UTC	145.775	ZR2FK	
USA					
CA Los Angeles	Wednesday	2000 local	144.144	W6SP	
CA Los Angeles	Daily	0730 local	144.144	W6KAG	
CA Los Angeles	Saturday	2200 UTC	144.144	W6SP	5
CA Los Altos	Tuesday	2000 local	147.150	WB6GFJ	4
CA San Diego	Wednesday	1930 local	145.660	WB6LLO	
CO Denver	Wednesday	2000 local	147.225	AAØP WDØFVV/R	11
GA Atlanta	Wednesday	2130 local	145.410	W4BIW W4PME/R	
IL Chicago	Wednesday	1930 local	146.880	WD9IIC K9GFY/R	7
MI Detroit	Wednesday	2000 local	224.460	WD8CIK K8OCL	12
NY Warwick	Tuesday	2000 local	144.280	WA2LQQ	6
TX Houston	Tuesday	2200 local	145.450	WA5ZIB WB5RDK/R	
TX Dallas	Wednesday	2000 local	146.610	WB5PMR ???/R	

Voice Net Notes:

1. This net may return to 21.280 Summer 1987 propagation conditions allowing.
2. This net may return to 21.280 Summer 1987 propagation conditions allowing.
3. Interim frequency; frequency is ±10 kHz.
4. WA6YCZ/R; additional links on K6GWE/R, 443.525; W6OA/R, 146.655; KU6A/R, 223.720.
5. Two-meter simulcast of South Pacific HF net by W6SP.
6. Two-meter simulcast of 75 Meter East Coast net by WA2LQQ.
7. PL 1B required for access.
8. Back-up frequency is 7.064 MHz.
9. Two-meter simulcast of 20 meter net by ZS6AKV.
10. From Pietermaritzburg.
11. Alternate NCS is WDØHHU.
12. Also linked via 147.22, 443.00, 443.55 and 1288.99 MHz.
13. Trial basis for Spring, 1987. See also note 2.

ORBIT PREDICTIONS

Satellite	**OSCAR-9**
Catalog number	12888
Epoch time:	87161.48080726
Element set:	1042
Inclination:	97.6443 deg
RA of node:	178.5937 deg
Eccentricity:	0.0000778
Arg of perigee:	218.9062 deg
Mean anomaly:	141.2124 deg
Mean motion:	15.29680979 rev/day
Decay rate:	1.823e-05 rev/day²
Epoch rev:	31571

Satellite	**OSCAR-10**
Catalog number	14129
Epoch time:	87165.79763504
Element set:	298
Inclination:	27.4174 deg
RA of node:	16.4314 deg
Eccentricity:	0.6025242
Arg of perigee:	216.3407 deg
Mean anomaly:	81.4866 deg
Mean motion:	2.05877680 rev/day
Decay rate:	8e-08 rev/day²
Epoch rev:	3011

Satellite	**OSCAR-11**
Catalog number	14781
Epoch time:	87148.71546274
Element set:	229
Inclination:	98.1014 deg
RA of node:	214.9439 deg
Eccentricity:	0.0013678
Arg of perigee:	155.1199 deg
Mean anomaly:	205.0663 deg
Mean motion:	14.62128973 rev/day
Decay rate:	1.08e-06 rev/day²
Epoch rev:	17285

Satellite	**OSCAR-12**
Catalog number	16909
Epoch time:	87152.82221216
Element set:	47
Inclination:	50.0099 deg
RA of node:	72.5579 deg
Eccentricity:	0.0011320
Arg of perigee:	246.5515 deg
Mean anomaly:	113.4115 deg
Mean motion:	12.44393206 rev/day
Decay rate:	-2.5e-07 rev/day²
Epoch rev:	3647

Satellite	**HS-5**
Catalog number	12999
Epoch time:	87159.31232971
Element set:	410
Inclination:	82.9565 deg
RA of node:	273.1107 deg
Eccentricity:	0.0009283
Arg of perigee:	45.9256 deg
Mean anomaly:	314.2549 deg
Mean motion:	12.05062771 rev/day
Decay rate:	1.2e-07 rev/day²
Epoch rev:	24076

Satellite	**RS-7**
Catalog number	13001
Epoch time:	87157.69176585
Element set:	322
Inclination:	82.9542 deg
RA of node:	266.2369 deg
Eccentricity:	0.0021675
Arg of perigee:	313.2460 deg
Mean anomaly:	46.6779 deg
Mean motion:	12.08701646 rev/day
Decay Rate	1.3e-07 rev/day²
Epoch rev:	24129

Satellite	**MIR**
Catalog number	16609
Epoch time:	87167.86958321
Element set:	682
Inclination:	51.6283 deg
RA of node:	159.4751 deg
Eccentricity:	0.0018943
Arg of perigee:	106.4943 deg
Mean anomaly:	253.6005 deg
ean motion:	15.71683896 rev/day
Decay rate:	4.1733e-04 rev/day²
Epoch rev:	7599

Satellite	**Salyut-7**
Catalog number	13138
Epoch time:	87168.84745782
Element set:	655
Inclination:	51.6117 deg
RA of node:	251.5959 deg
Eccentricity:	0.0000820
Arg of perigee:	197.5796 deg
Mean anomaly:	162.4830 deg
Mean motion:	15.31136644 rev/day
Decay rate:	2.821e-05 rev/day²
Epoch rev:	29608

Satellite	Meteor 2-12
Catalog number	15516
Epoch time:	87166.95834281
Element set:	880
Inclination:	82.5335 deg
RA of node:	167.0340 deg
Eccentricity:	0.0017237
Arg of perigee:	15.2596 deg
Mean anomaly:	344.9082 deg
Mean motion:	13.83934986 rev/day
Decay rate:	1.17e-06 rev/day²
Epoch rev:	11977

Satellite	Meteor 2-13
Catalog number	16408
Epoch time:	87166.21911174
Element set:	284
Inclination:	82.5368 deg
RA of node:	82.5605 deg
Eccentricity:	0.0015483
Arg of perigee:	192.5146 deg
Mean anomaly:	167.5635 deg
Mean motion:	13.84018242 rev/day
Decay rate:	6.0e-08 rev/day²
Epoch rev:	7416

Satellite	Meteor 2-14
Catalog number	16735
Epoch time:	87151.37312472
Element set:	126
Inclination:	82.5365 deg
RA of node:	120.7966 deg
Eccentricity:	0.0013863
Arg of perigee:	316.5134 deg
Mean anomaly:	43.4938 deg
Mean motion:	13.83753288 rev/day
Decay rate:	6.0e-08 rev/day²
Epoch rev:	5103

Satellite	Meteor 2-15
Catalog number	17290
Epoch time:	87166.52953620
Element set:	47
Inclination:	82.4713 deg
RA of node:	21.3280 deg
Eccentricity:	0.0014068
Arg of perigee:	146.0043 deg
Mean anomaly:	214.2038 deg
Mean motion:	13.83562052 rev/day
Decay rate:	6.0e-08 rev/day²
Epoch rev:	2230

Satellite	Meteor 3-1
Catalog number	16191
Epoch time:	87166.95443455
Element set:	649
Inclination:	82.5498 deg
RA of node:	33.5110 deg
Eccentricity:	0.0020072
Arg of perigee:	332.0331 deg
Mean anomaly:	27.9712 deg
Mean motion:	13.16929674 rev/day
Decay rate:	4.3e-07 rev/day²
Epoch rev:	7914

Keplerian elements for weather satellites

Sat.	M2-12	M2-13	M2-14	M2-15?	M3-1	NOAA-9	NOAA-10
Set#	880	284	126	47	649	167	53
New?	Y	Y	N	Y	Y	N	Y

Keplerian Elements for manned and miscellaneous missions.

Sat.	Mir	Salyut-7	Ajisai
Set#	642	655	42
New?	Y	Y	Y

Keplerian Elements for OSCARs

Sat.	UO-9	AO-10	UO-11	FO-12	RS-5	RS-7
Set#	1042	298	229	47	410	322
New?	Y	Y	N	N	Y	Y

Satellite	noaa-9
Catalog number	15427
Epoch time:	87149.03163697
Element set:	167
Inclination:	99.0497 deg
RA of node:	114.5118 deg
Eccentricity:	0.0014598
Arg of perigee:	260.9008 deg
Mean anomaly:	99.0511 deg
Mean motion:	14.11497068 rev/day
Decay rate:	1.01e-06 rev/day²
Epoch rev:	12661

Satellite	noaa-10
Catalog number	16969
Epoch time:	87158.63424138
Element set:	53
Inclination:	98.7175 deg
RA of node:	189.2458 deg
Eccentricity:	0.0012750
Arg of perigee:	231.2376 deg
Mean anomaly:	128.7663 deg
Mean motion:	14.22509621 rev/day
Decay rate:	4.7e-07 rev/day²
Epoch rev:	3738

Satellite	ajisai
Catalog number	16908
Epoch time:	87161.02040772
Element set:	42
Inclination:	50.0106 deg
RA of node:	47.3046 deg
Eccentricity:	0.0011069
Arg of perigee:	269.3026 deg
Mean anomaly:	90.6540 deg
Mean motion:	12.44368613 rev/day
Decay rate:	-2.5e-07 rev/day²
Epoch rev:	3750

AMSAT® NA

The Radio Amateur Satellite Corporation

Post Office Box 27
Washington, DC 20044
(301) 589-6062

Non-Profit
Organization
Second Class
POSTAGE PAID
at
Waterbury, Conn.

The top prize at this year's annual meeting will be this IC-475A all-mode 70 cm transceiver.

LM-1096 KA6M 99.81
MAGNUSKI, HANK
2019 BARBARA DR.
PALO ALTO CA 94303

Amateur Satellite Report (ISSN 0889-6089) is published biweekly for [illegible] (inseparable from annual membership dues of $24) by AMSAT, Post Office Box 27, Washington, DC 20044. Second class postage paid at Silver Spring, MD and additional mailing offices. POSTMASTER: send address changes to *Amateur Satellite Report*, Post Office Box 27, Washington, DC 20044.